

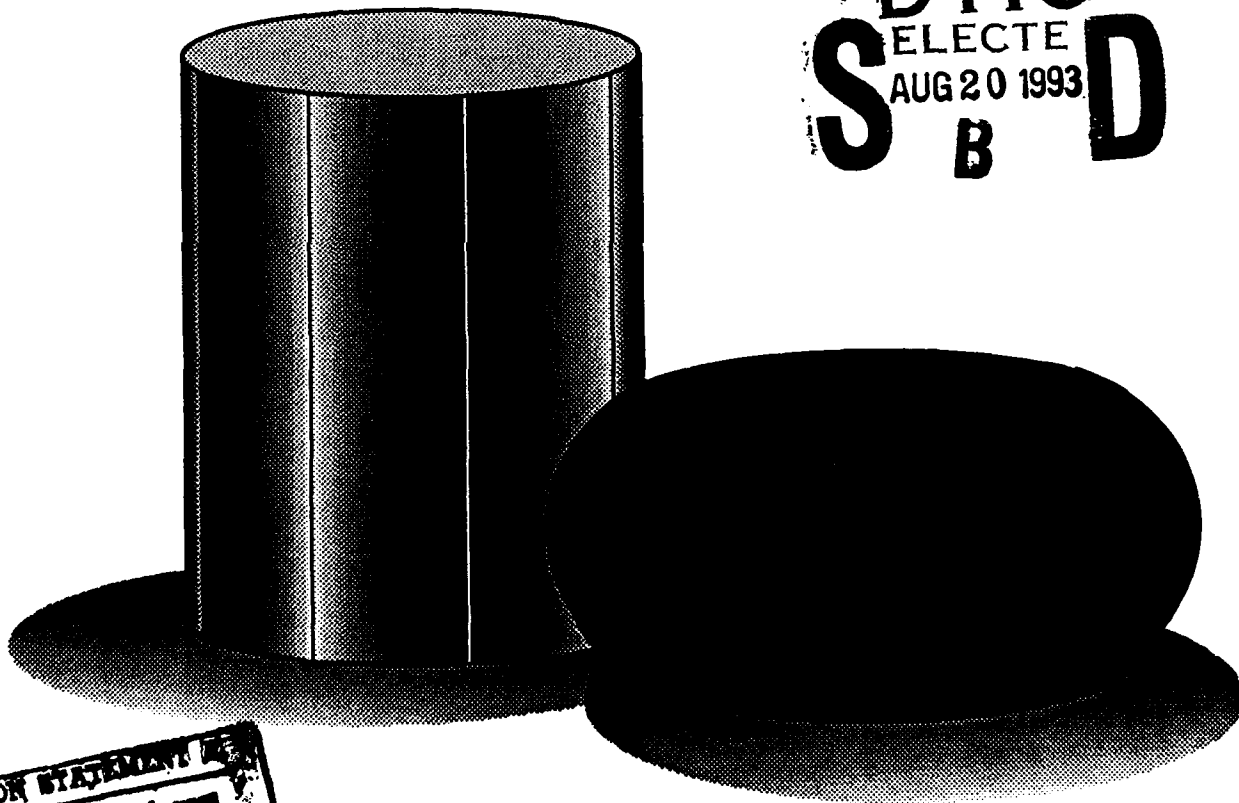
AD-A268 263



Handwritten signature or initials

Atlas of Formability,

Permalloy - 80
Flow Stress Curves,



DTIC
ELECTE
AUG 20 1993
S B D

DISTRIBUTION STATEMENT A
Approved for public release
Distribution Unlimited

93-19397



NCEMT

93 8 19 107

ATLAS OF FORMABILITY

PERMALLOY - 80

by

Howard A. Kuhn

**National Center for Excellence in Metalworking Technology
1450 Scalp Avenue
Johnstown, PA 15904**

for

**Naval Industrial Resource Support Activity
Building 75-2, Naval Base
Philadelphia, PA 19112-5078**

February 25, 1991

The views, opinions, and/or findings contained in this report are those of the authors and should not be construed as an official Department of the Navy position, policy, or decision, unless so designated by other documentation

REPORT DOCUMENTATION PAGEForm Approved /
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE February 25, 1991	3. REPORT TYPE AND DATES COVERED Final, Nov. 30, 1992 - Feb. 25, 1993
4. TITLE AND SUBTITLE ATLAS OF FORMABILITY PERMALLOY - 80			5. FUNDING NUMBERS C-N00140-88-C-RC21
6. AUTHOR(S) Howard A. Kuhn			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) National Center for Excellence in Metalworking Technology (NCEMT) 1450 Scalp Avenue Johnstown, PA 15904			8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) Naval Industrial Resources Support Activity Building 75-2, Naval Base Philadelphia, PA 19112-5078			10. SPONSORING / MONITORING AGENCY REPORT NUMBER
11. SUPPLEMENTARY NOTES			
12a. DISTRIBUTION / AVAILABILITY STATEMENT			12b. DISTRIBUTION CODE
13. ABSTRACT (Maximum 200 words) In this investigation, flow behavior of Permalloy - 80 alloy was studied by conducting compression tests over a wide range of temperatures (1112 - 2192 F) at high strain rates ($1 - 10 \text{ s}^{-1}$). The true stress-true strain flow curves are presented for each test condition. This report supplies ample mechanical property data on Permalloy - 80 alloy for mechanical and materials engineers in the field of metalworking process design. The data presented here are also very helpful in finite element analysis of metalworking processes.			
14. SUBJECT TERMS Permalloy - 80, Deformation Processing, High Temperature Deformation, Processing Map, Metalworking, Microstructure			15. NUMBER OF PAGES 22
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT

TABLE OF CONTENTS

Chemical composition	1
Testing Parameters	1
Stress-Strain Curves	2

DTIC QUALITY INSPECTED 3

ST #A, AUTH USNAVIRSA (MR PLONSKY 8/443-6684)
 PER TELECON, 17 AUG 93 CB

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By <i>per telecon</i>	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
<i>A-1</i>	

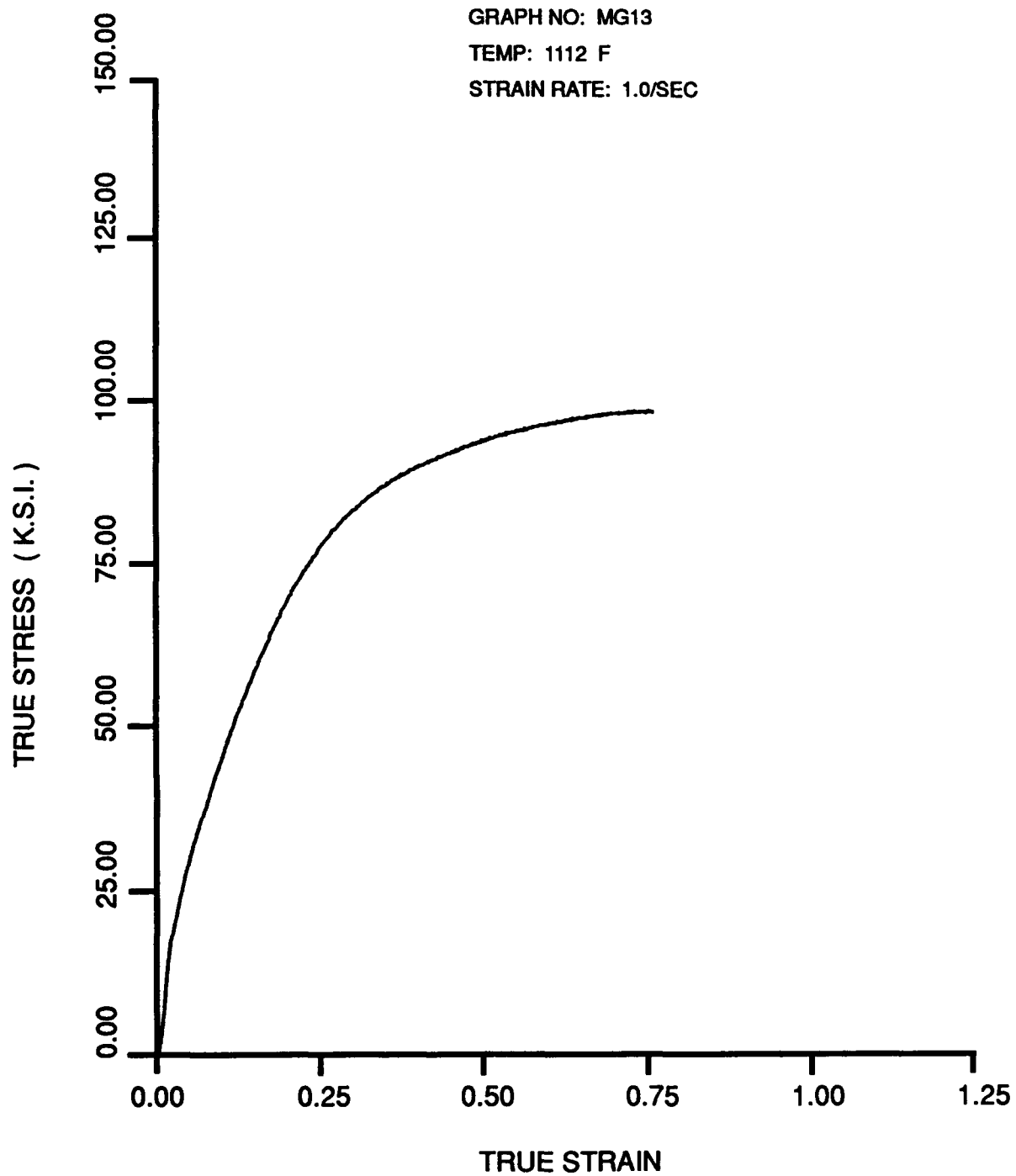
Permalloy - 80

Composition:

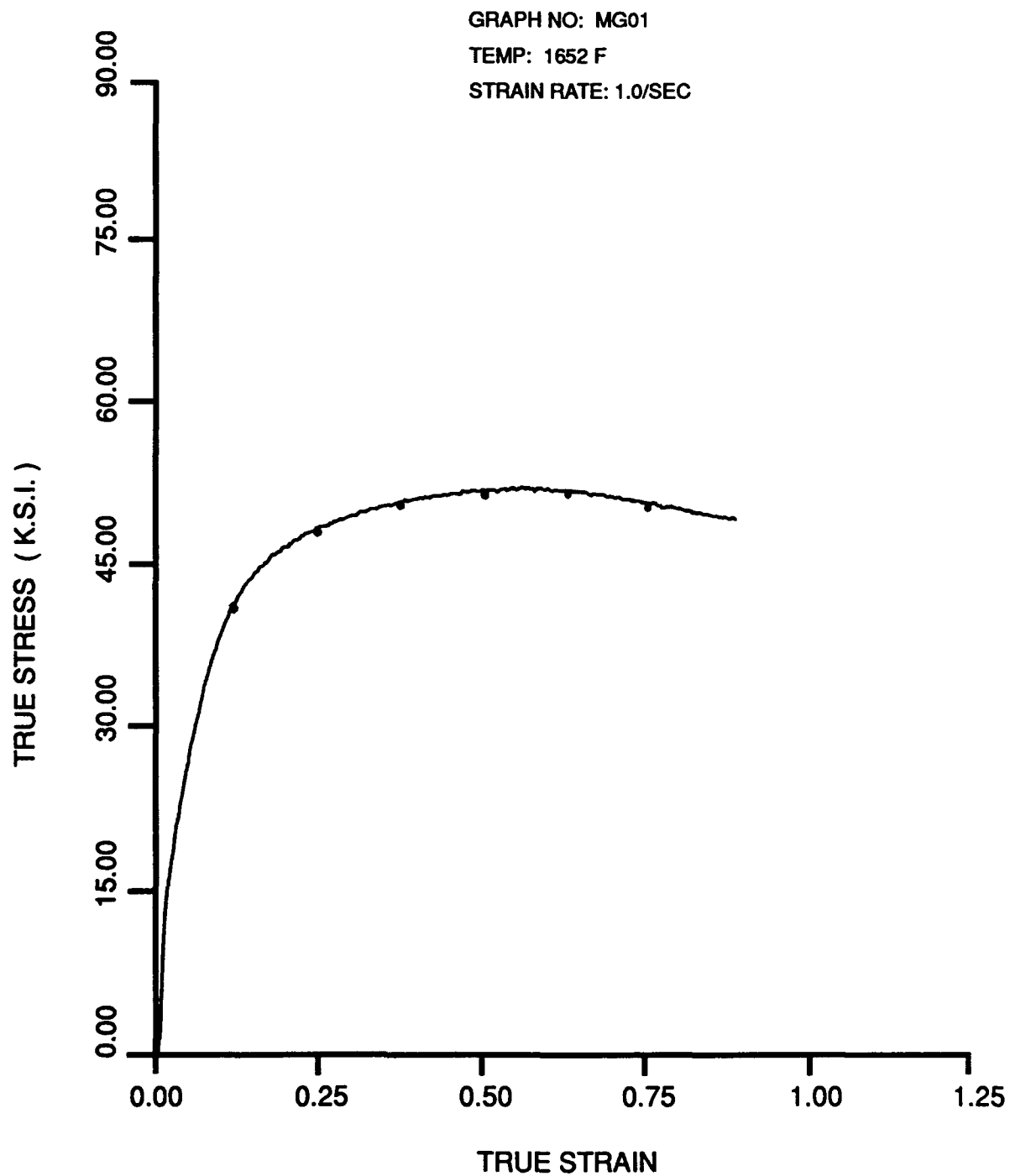
Ni	Fe	Mo	Mn	Si
80.2	14.6	4.4	0.5	0.3

Testing Parameters

Strain Rate (1/sec.)	Temperature (deg. F)	Graph Number	Page Number
1.0	1112	MG13	2
1.0	1652	MG01	3
1.0	2192	MG26	4
2.3	1270	MG14	5
2.3	1652	MG02	6
2.3	2034	MG18	7
2.4	1270	MG15	8
2.4	2034	MG20	9
5.0	1652	MG03	10
5.5	1112	MG09	11
5.5	1652	MG30	12
5.5	2192	MG25	13
8.6	1270	MG16	14
8.6	2034	MG17	15
10.0	1112	MG22	16
10.0	1652	MG10	17
10.0	2192	MG23	18



NCEMT

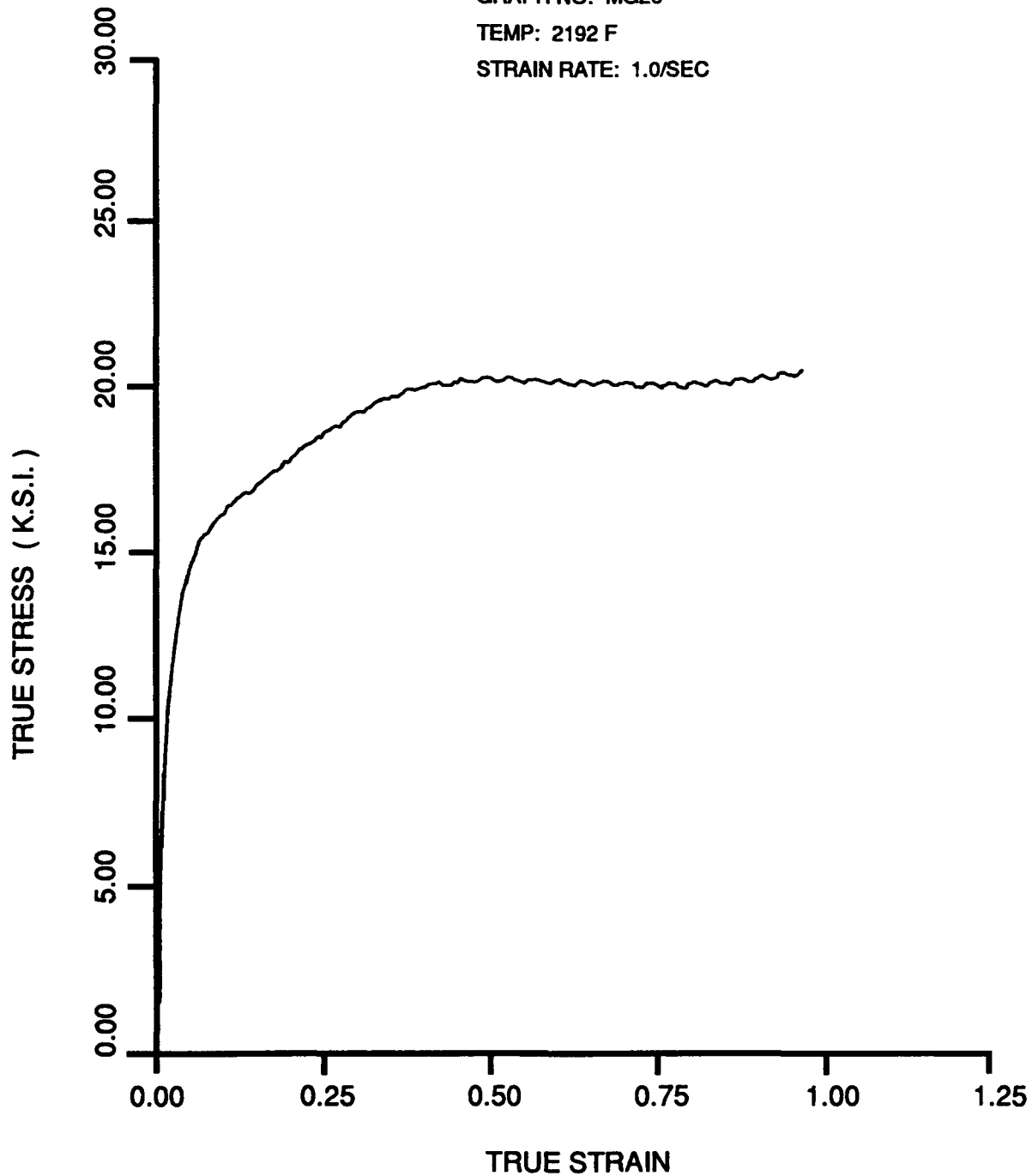


NCEMT

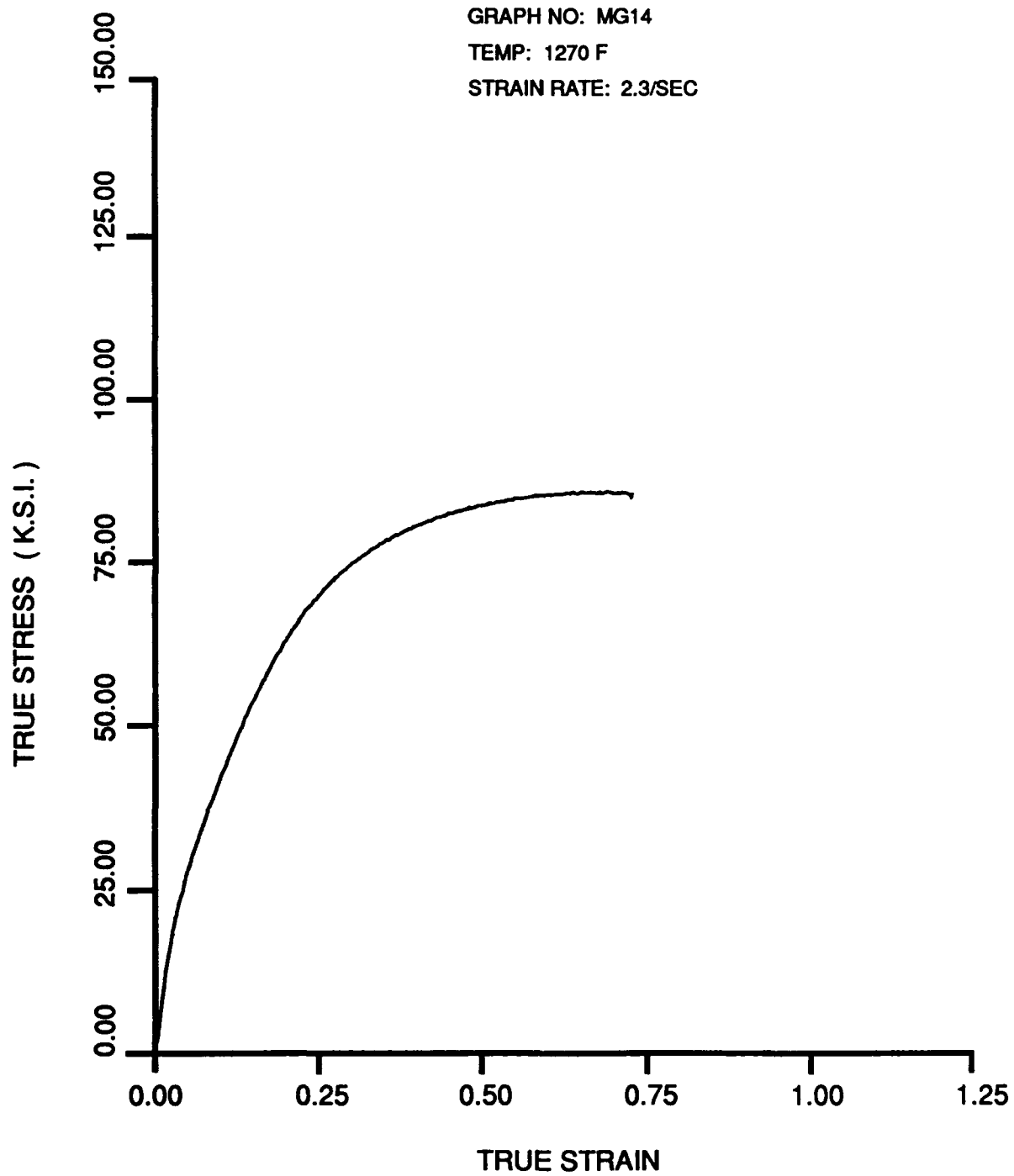
GRAPH NO: MG26

TEMP: 2192 F

STRAIN RATE: 1.0/SEC



NCEMT

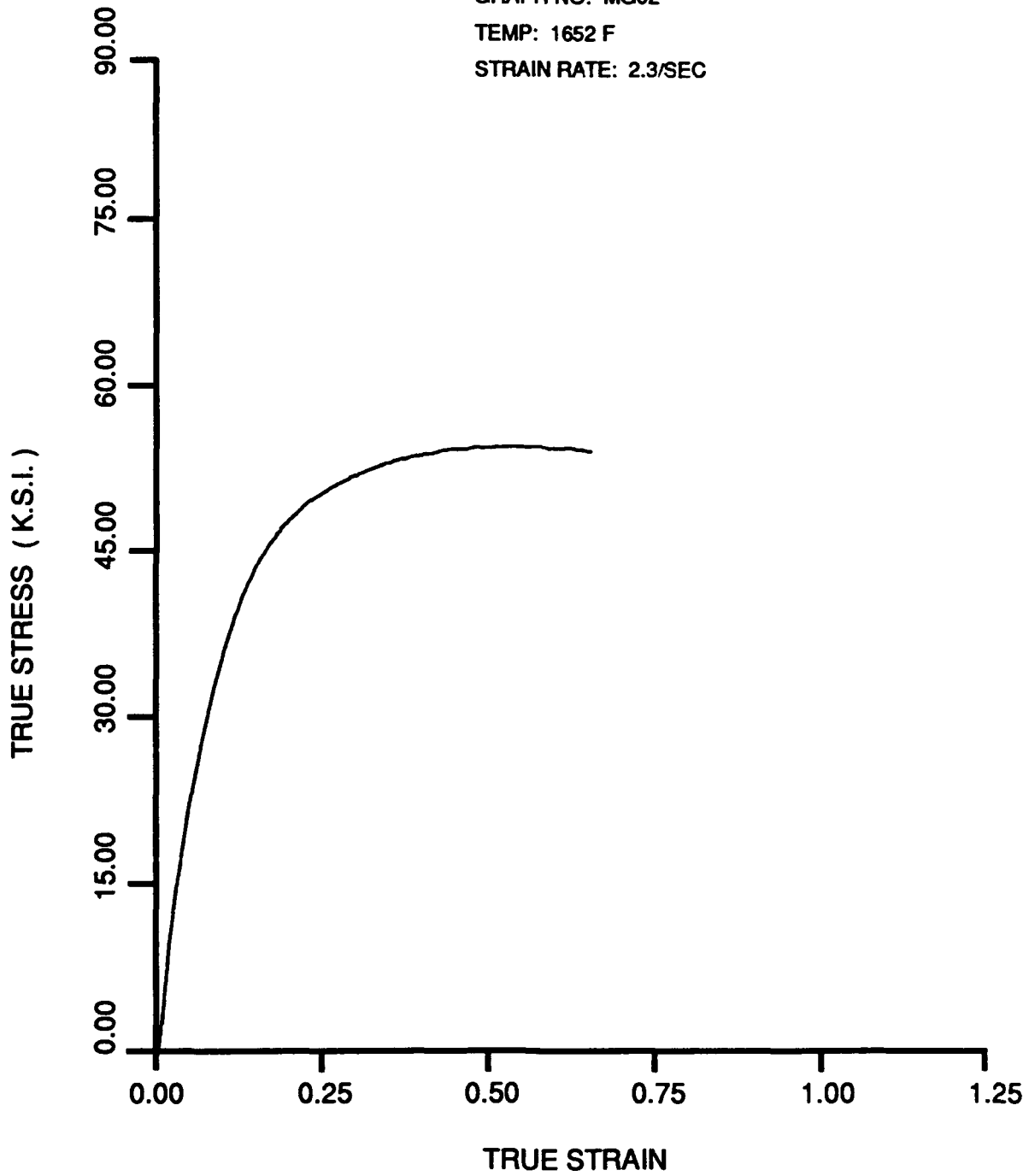


NCEMT

GRAPH NO: MG02

TEMP: 1652 F

STRAIN RATE: 2.3/SEC

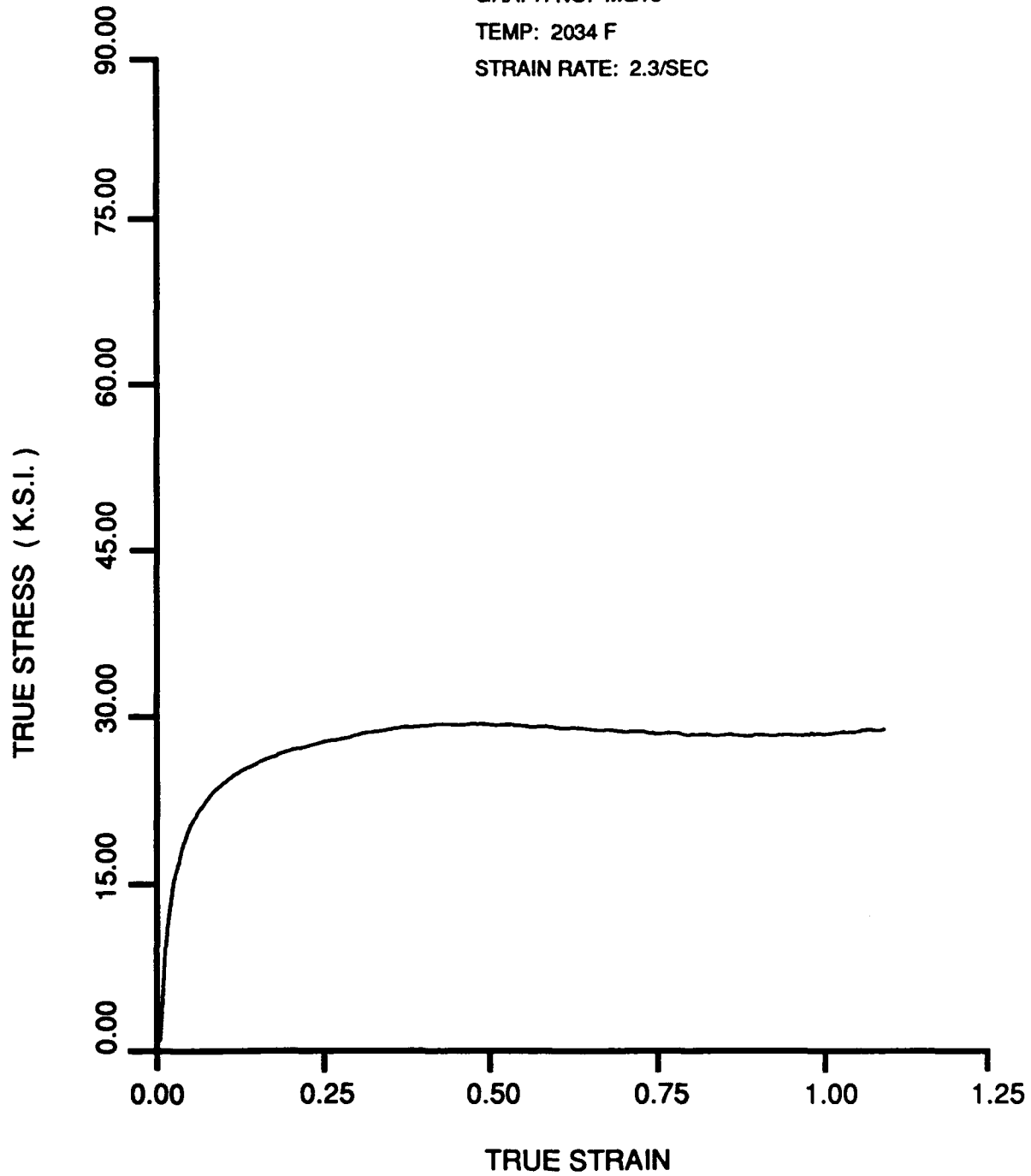


NCEMT

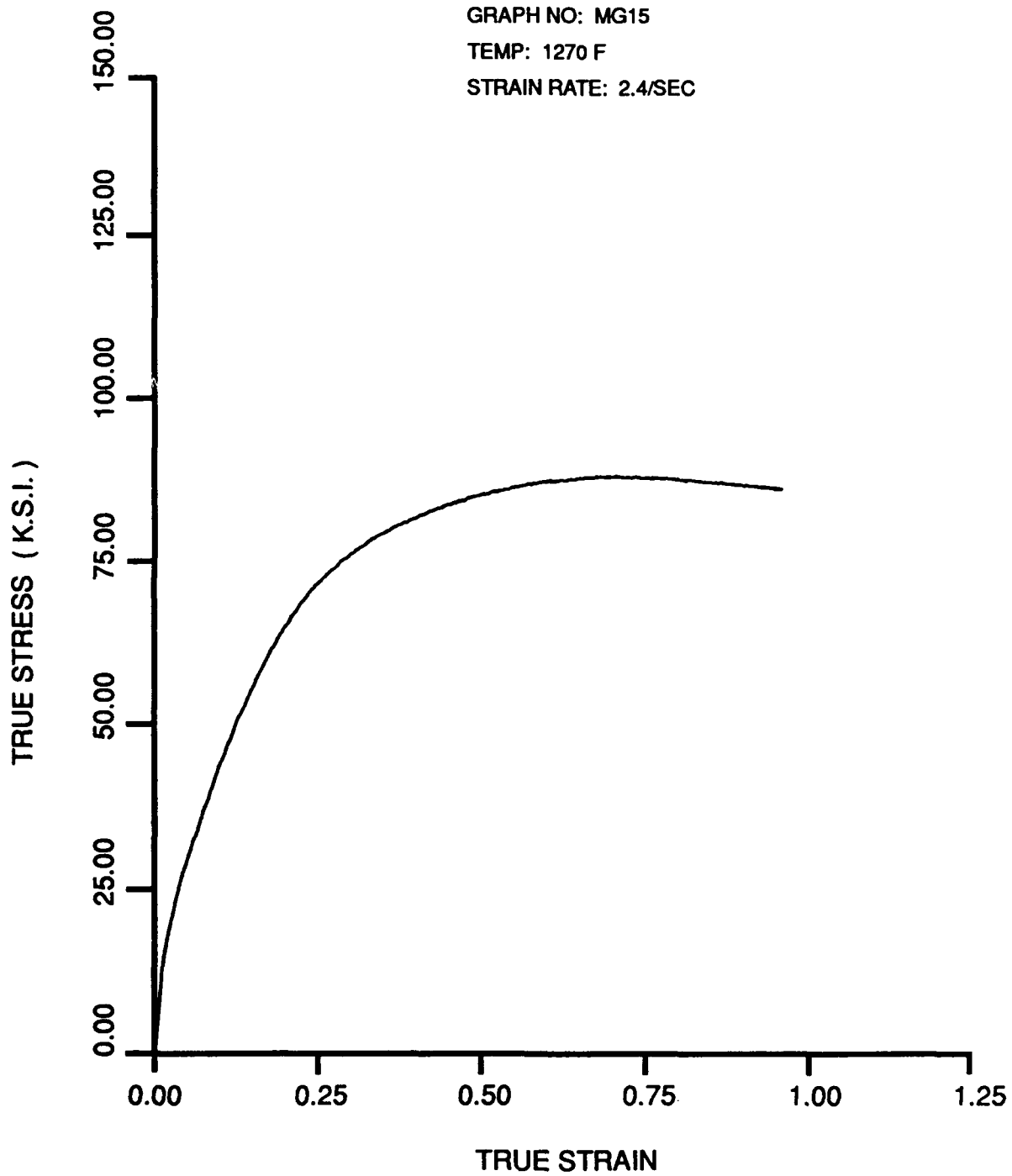
GRAPH NO: MG18

TEMP: 2034 F

STRAIN RATE: 2.3/SEC



NCEMT

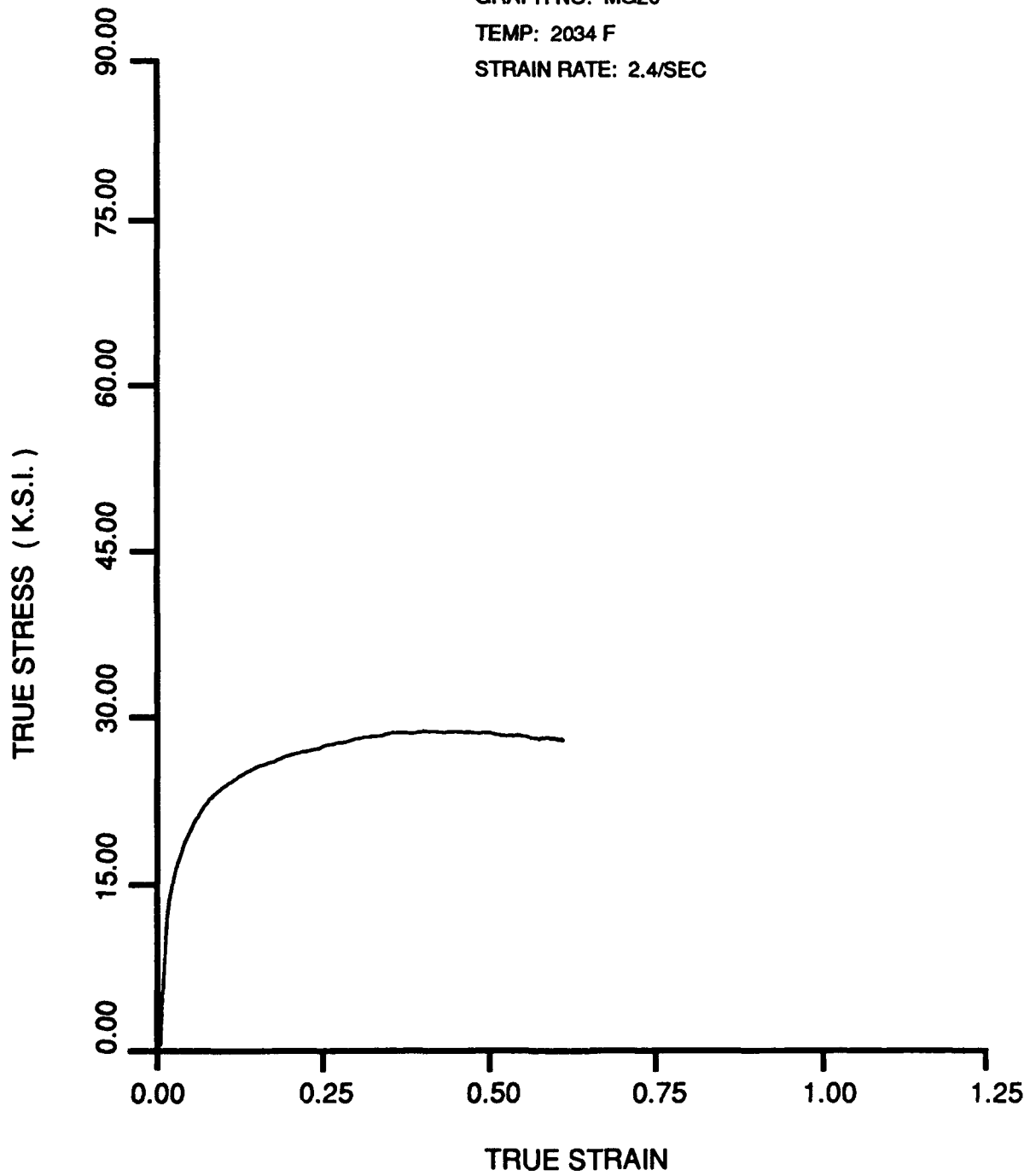


NCEMT

GRAPH NO: MG20

TEMP: 2034 F

STRAIN RATE: 2.4/SEC

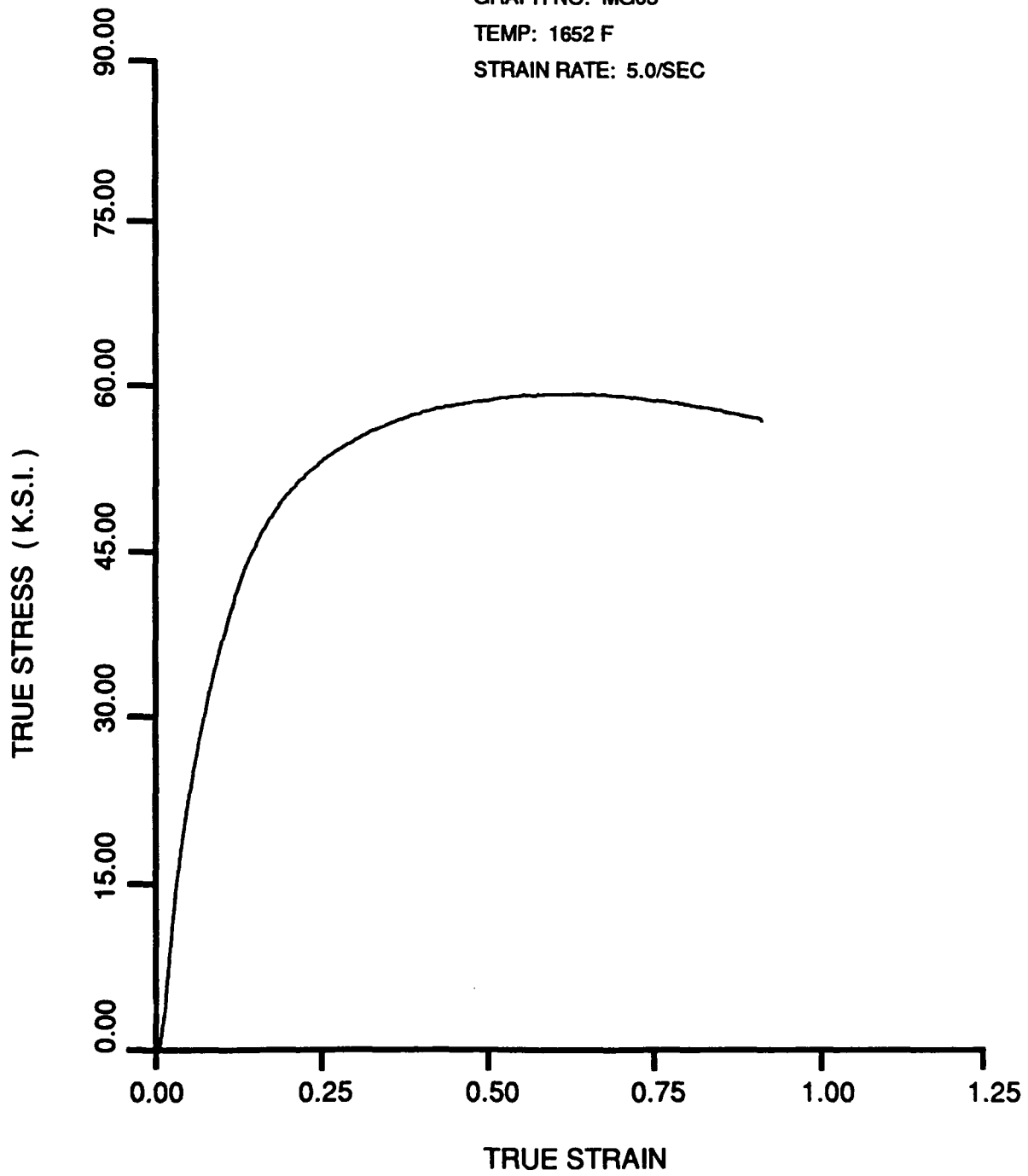


NCEMT

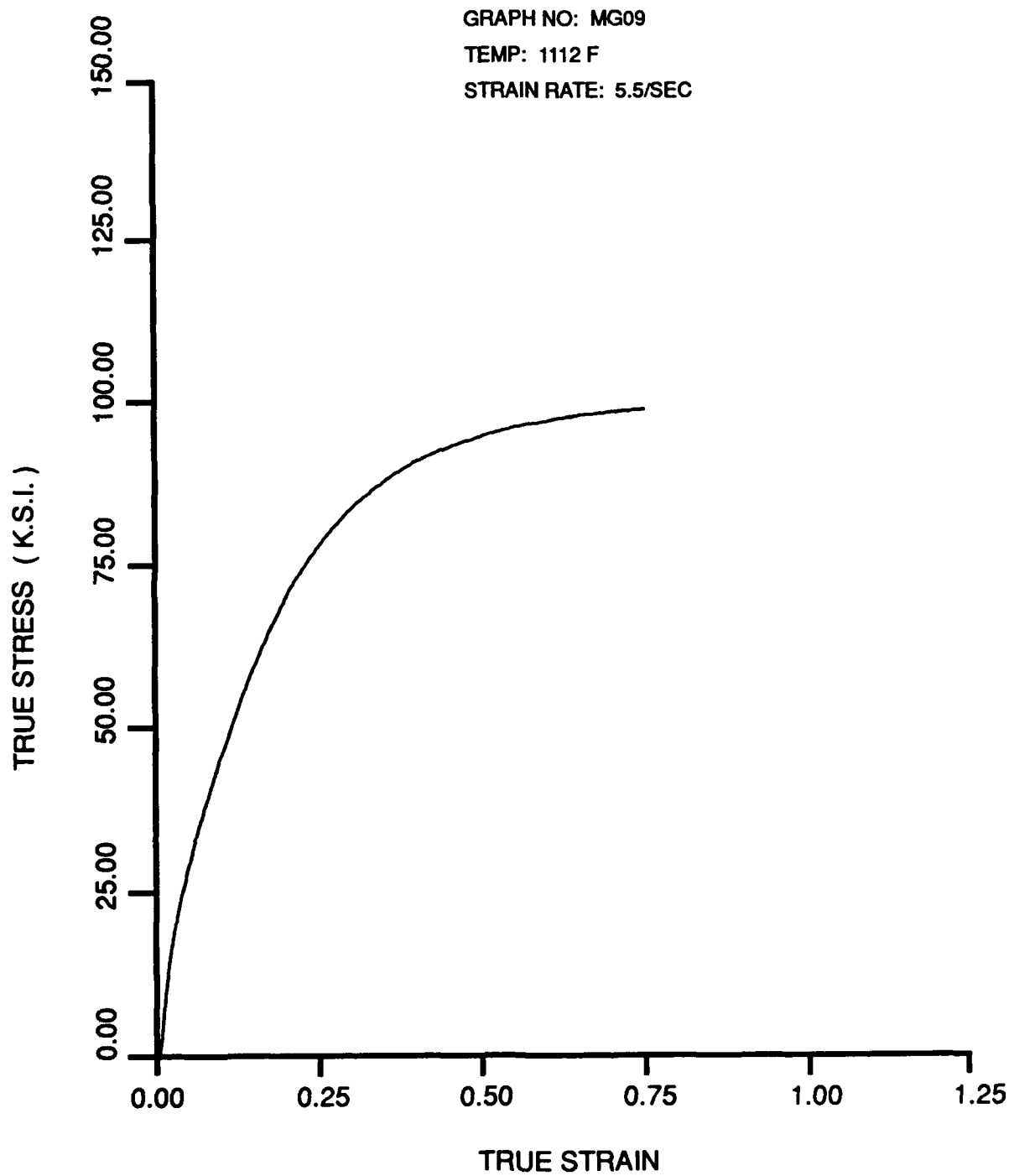
GRAPH NO: MG03

TEMP: 1652 F

STRAIN RATE: 5.0/SEC



NCEMT

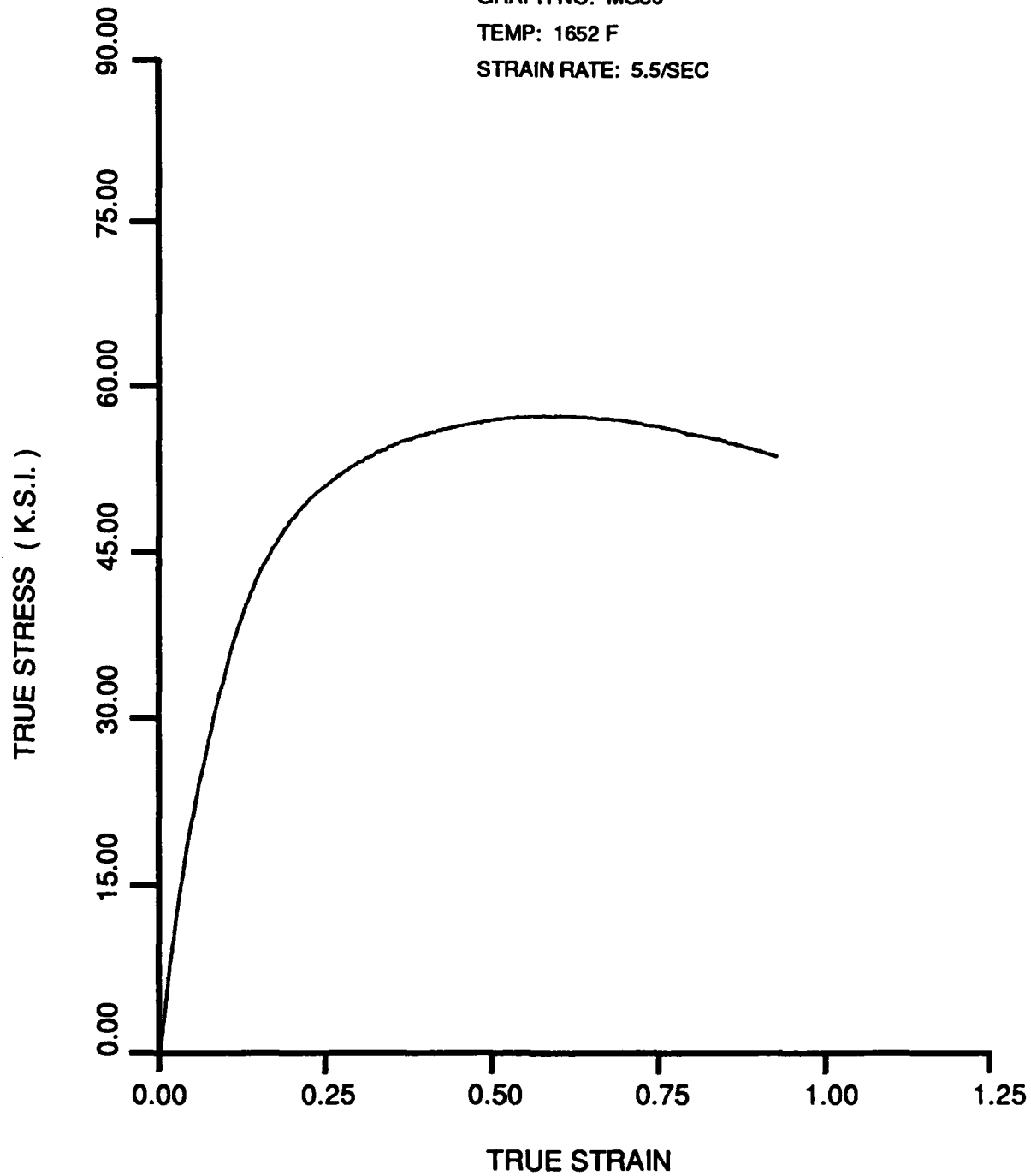


NCEMT

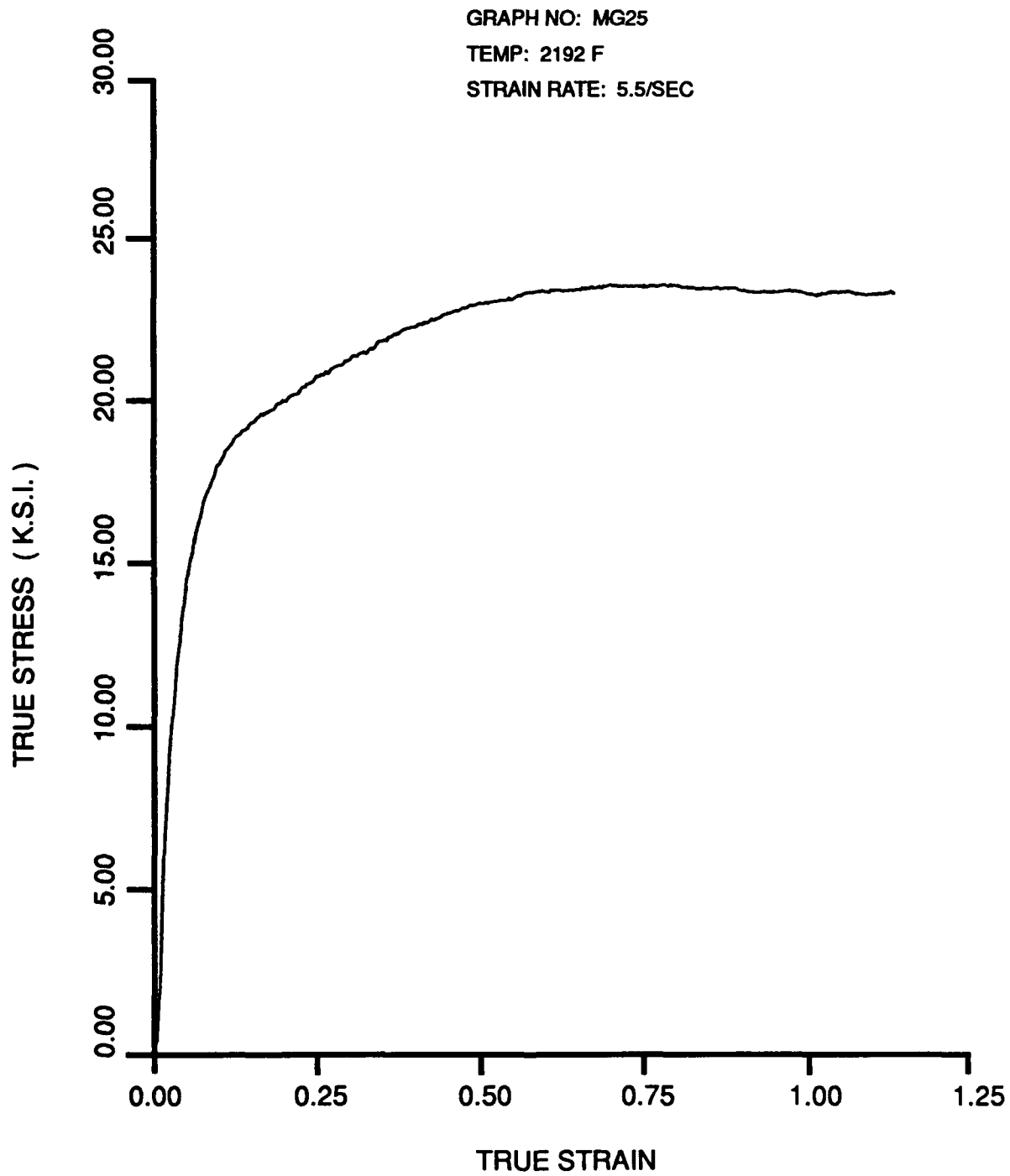
GRAPH NO: MG30

TEMP: 1652 F

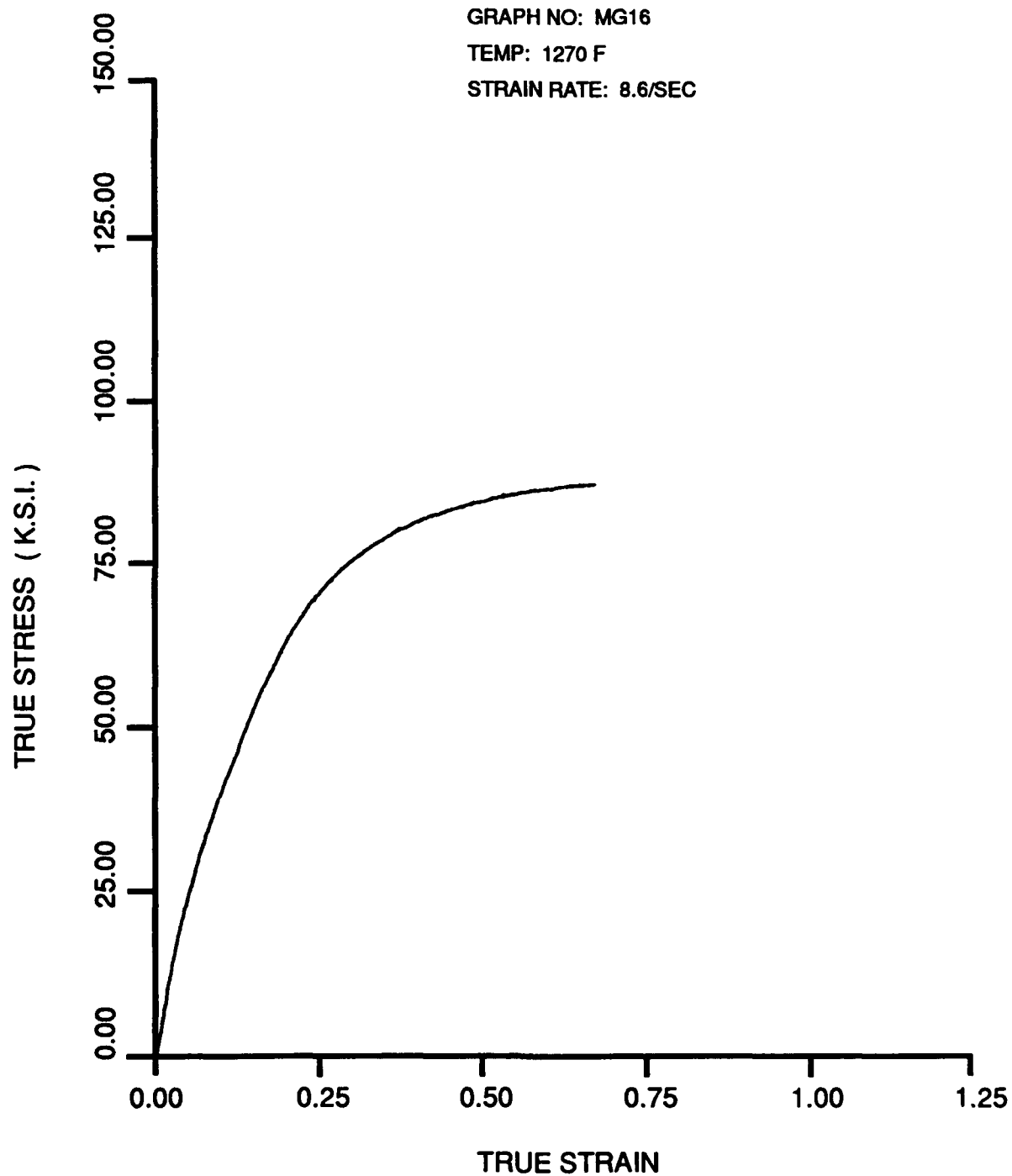
STRAIN RATE: 5.5/SEC



NCEMT



NCEMT

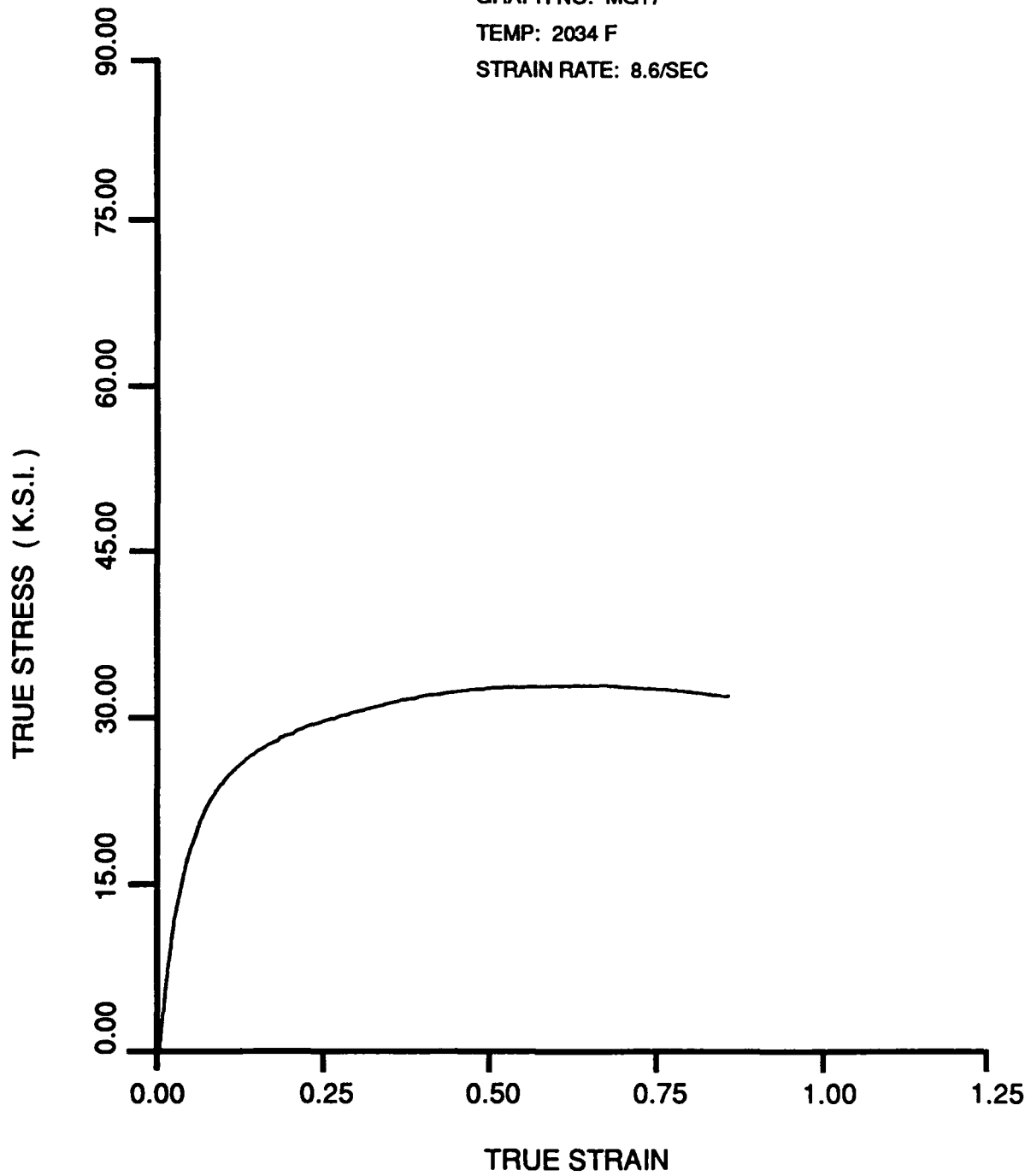


NCEMT

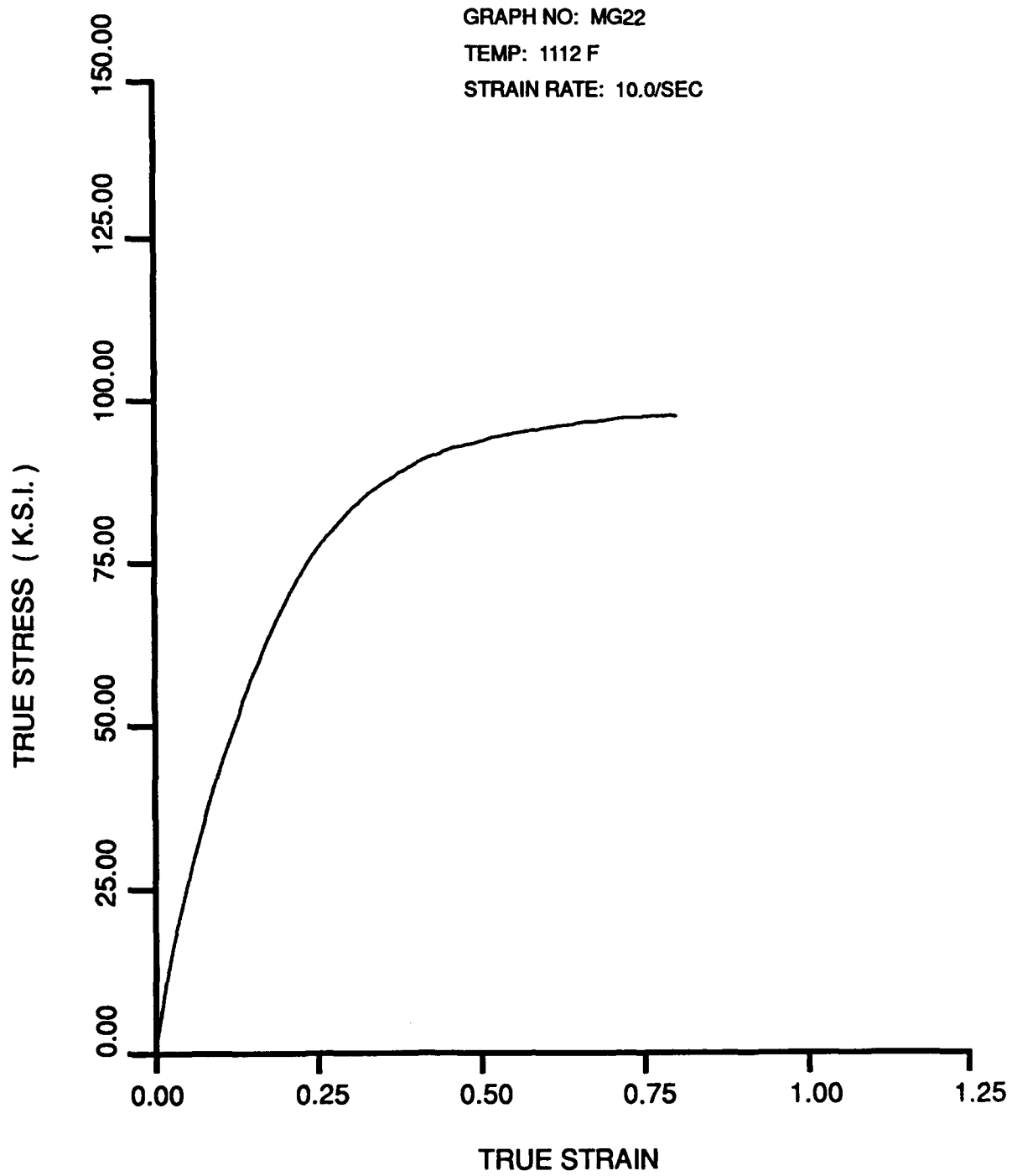
GRAPH NO: MG17

TEMP: 2034 F

STRAIN RATE: 8.6/SEC



NCEMT

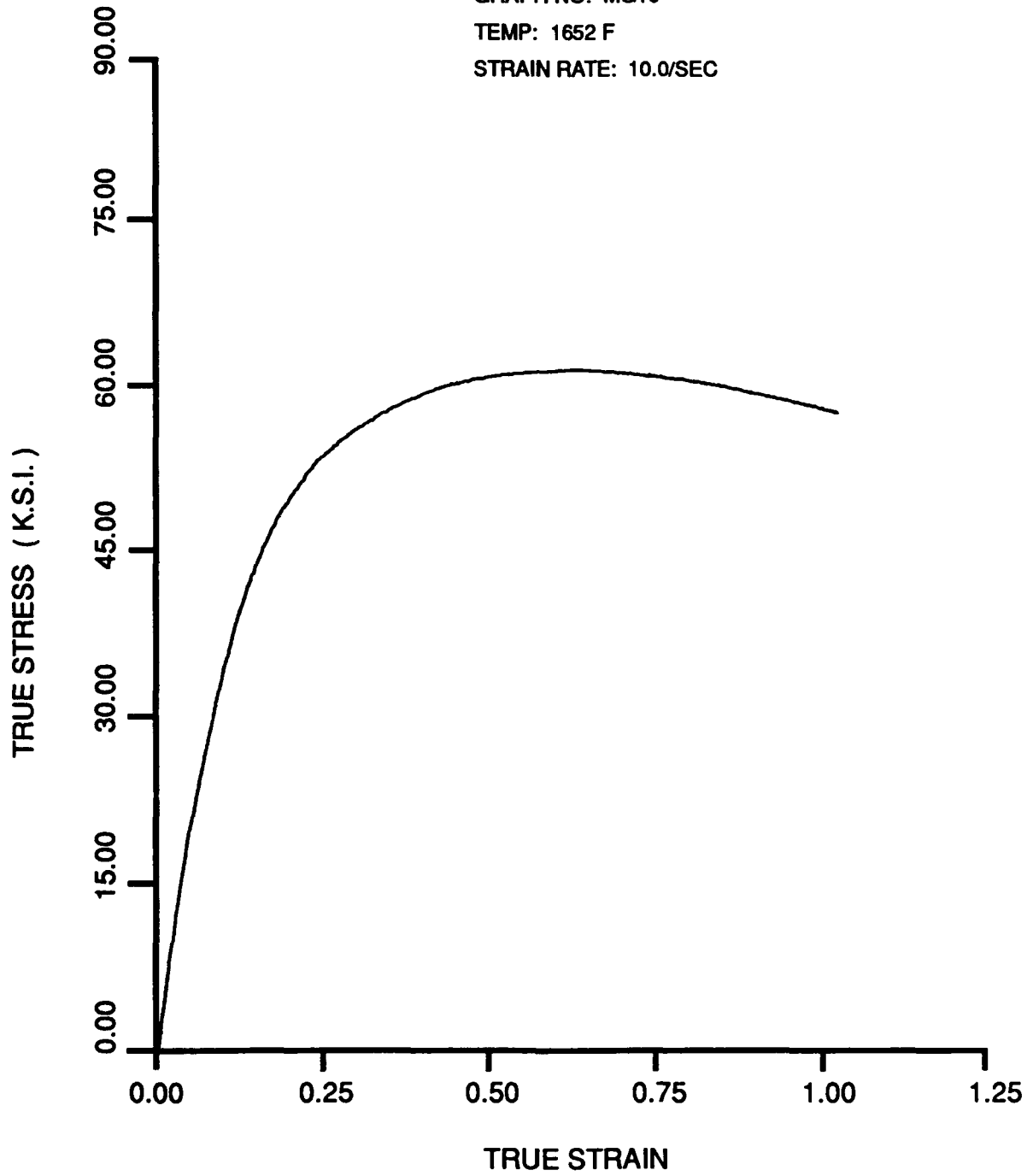


NCEMT

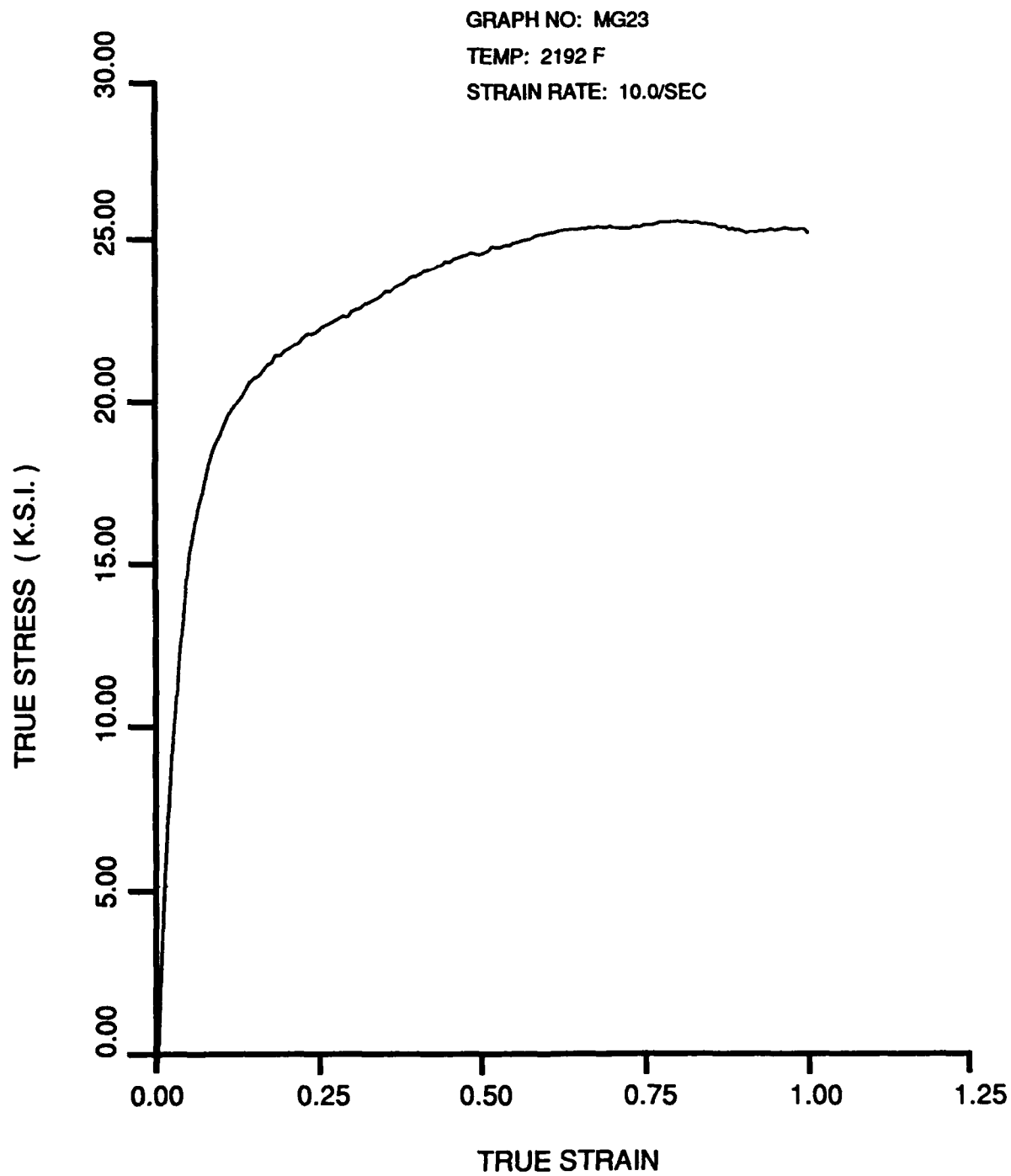
GRAPH NO: MG10

TEMP: 1652 F

STRAIN RATE: 10.0/SEC



NCEMT



NCEMT